

IN THE CLAIMS

Please amend claims 1-4, 10, 13-16, 18, 21, 27, 28, and 30.

Please enter the pending claims, including claims 1-30, as follows:

1. (Currently Amended) A method comprising:

providing a photolithographic scanner, said photolithographic scanner ~~having comprising~~ a light source and a last lens element, said light source producing light having a wavelength, said last lens element having a refractive index;

~~determining~~ providing an index-matching liquid (IML) based on said wavelength and said refractive index;

providing a photoresist, said photoresist comprising a combination of one or more IML-non-soluble additives and one or more IML-soluble-additives;

placing said ~~index matching liquid~~ IML in contact with both said last lens element and said photoresist; and

illuminating said IML and said photoresist with said light from said last lens element

~~determining form and concentration of a set of one or more constituents to improve contact of a photoresist with said index matching liquid;~~

~~providing the photoresist to be illuminated by said light through said last lens element and said index matching liquid;~~

~~adding said set of one or more constituents to said photoresist; and~~

~~placing said photoresist in contact with said index matching liquid.~~

2. (Currently Amended) The method of claim 1 wherein said ~~set of one or more constituents~~ combination of one or more IML-non-soluble additives and one or more IML-soluble-additives is ~~determined~~ based upon said IML ~~index-matching liquid of an immersion lithography exposure system~~.
3. (Currently Amended) The method of claim ~~[[2]]~~ 1 wherein said ~~index-matching liquid~~ IML comprises water.
4. (Currently Amended) The method of claim ~~[[3]]~~ 1 wherein said ~~set of one or more constituents~~ IML-non-soluble additives comprises at least one water-insoluble constituent.
5. (Previously Presented) The method of claim 4 wherein said at least one water-insoluble constituent is selected from a group consisting of a hydrophobic ionic photoacid generator and a non-ionic photoacid generator.
6. (Previously Presented) The method of claim 4 wherein said at least one water-insoluble constituent comprises a water-insoluble quencher.
7. (Previously Presented) The method of claim 4 wherein said at least one water-insoluble constituent comprises a water-insoluble polymer.
8. (Previously Presented) The method of claim 4 wherein water-soluble constituents are bound to said at least one water insoluble constituent via a binding method selected from a group consisting of covalent binding, ion pairing, and Van der Waal's forces.

9. (Previously Presented) The method of claim 4 wherein said at least one water-insoluble constituent may react when said photoresist is used to modulate susceptibility to etch.
10. (Currently Amended) The method of claim ~~[[3]]~~ 1 wherein said ~~set of~~ one or more ~~constituents~~ IML-soluble additives comprises at least one water-soluble constituent.
11. (Previously Presented) The method of claim 10 wherein said at least one water-soluble constituent is selected from a group consisting of a water-soluble photoacid generator, a water-soluble quencher, a water-soluble buffer, a water-soluble surfactant, and a water-soluble plasticizer.
12. (Previously Presented) The method of claim 11 wherein said water-soluble surfactant is a fluorocarbon-based surfactant.
13. (Currently Amended) An apparatus comprising:
- a substrate;
 - a photoresist ~~deposited on~~ disposed in contact said substrate, ~~said photoresist having incorporated therein one or more additives that modulate an interface and improve liquid contact properties of said photoresist to an index-matching liquid;~~
 - ~~the~~ an index-matching liquid (IML) disposed in contact with said photoresist, ~~the index-matching liquid having a detrimental effect on said photoresist if said one or more additives had not been incorporated into said photoresist;~~ and
 - a last lens element disposed in contact with said ~~index-matching liquid~~ IML, wherein said photoresist comprises a combination of one or more IML-non-soluble additives and one or more IML-soluble-additives.

14. (Currently Amended) The apparatus of claim 13 wherein said ~~liquid-contact~~ ~~properties of said photoresist~~ one or more IML-soluble additives are specific to a particular IML liquid.
15. (Currently Amended) The apparatus of claim 14 wherein said particular IML liquid comprises water and said one or more IML-non-soluble additives comprises at least one hydrophobic additive.
16. (Currently Amended) The apparatus of claim 15 wherein said at least one hydrophobic additive comprises ~~an~~ a non-ionic photoacid generator.
17. (Previously Presented) The apparatus of claim 15 wherein said at least one hydrophobic additive comprises a water-insoluble quencher.
18. (Currently Amended) The apparatus of claim 15 wherein said at least one ~~of said~~ hydrophobic additives comprises a water-insoluble polymer.
19. (Previously Presented) The apparatus of claim 15 wherein water-soluble constituents are bound to said at least one hydrophobic additive via a binding method selected from a group consisting of covalent binding, ion pairing, and Van der Waal's forces.
20. (Previously Presented) The apparatus of claim 15 wherein said at least one hydrophobic additive may react when said photoresist is used to modulate susceptibility to etch.
21. (Currently Amended) The apparatus of claim 14 wherein said particular IML liquid comprises water and said one or more IML-soluble additives comprises at least one hydrophilic additive.

22. (Previously Presented) The apparatus of claim 21 wherein said at least one hydrophilic additive comprises a water-soluble quencher.
23. (Previously Presented) The apparatus of claim 21 wherein said at least one hydrophilic additive comprises a water-soluble buffer.
24. (Previously Presented) The apparatus of claim 21 wherein said at least one hydrophilic additive comprises a water-soluble surfactant.
25. (Previously Presented) The apparatus of claim 24 wherein said water-soluble surfactant comprises a fluorocarbon-based surfactant.
26. (Previously Presented) The apparatus of claim 21 wherein said at least one hydrophilic additive comprises a water-soluble plasticizer.
27. (Currently Amended) A system comprising:
- a last lens element of a lithography exposure system, said last lens element having a specific index of refraction;
 - an index-matching liquid (IML) in contact with said last lens element, said ~~index-matching liquid~~ IML having an index of refraction equal to said specific index of refraction to within a specified tolerance; and
 - a photoresist ~~layer~~ in contact with said ~~index-matching liquid~~ IML, said photoresist ~~layer~~ comprising a combination of one or more IML-non-soluble additives and one or more IML-soluble-additives having incorporated therein one or more constituents that reduce surface interaction and protect said photoresist layer from said index-matching liquid.

28. (Currently Amended) The system of claim 27 wherein said ~~index-matching liquid~~ IML comprises water and said one or more IML-non-soluble additives ~~constituents~~ comprises at least one water-insoluble constituent.
29. (Previously Presented) The system of claim 28 wherein said at least one water-insoluble constituent comprises a constituent selected from a group consisting of a non-ionic photoacid generator, a hydrophobic ionic photoacid generator, a quencher, a polymer, an oligomer, and a molecular species.
30. (Currently Amended) The system of claim 27 wherein said ~~index-matching liquid~~ IML comprises water and said one or more ~~constituents~~ IML-soluble-additives comprises at least one water-soluble constituent wherein said at least one water-soluble constituents comprises a constituent selected from a group consisting of a water-soluble photoacid generator, a water-soluble quencher, a water-soluble buffer, a water-soluble surfactant, and a water-soluble plasticizer.